

rests conformably on Llandovery rocks below, and passes up without a break into Wenlock beds above. This rock-series is stratigraphically continuous from base to summit, and includes the four divisions of the Brynmair, Gelli, Talerddig, and Dolgau Groups, which, while they possess distinctive features of their own, are bound together by common palæontological characters. The lowest two, namely, the Brynmair and Gelli Groups, consist mainly of grey shales and mudstones with beds of thin flags, which increase in number and thickness as one ascends the sequence. The Talerddig Group is distinctly an arenaceous one, and contains numerous bands of thick grit which are generally massed together at four or five distinct horizons. The highest member of the series, the Dolgau Group, answering to the local 'Tarannon Shales' of the Geological Survey, consists of pale-grey and purple mudstones, the latter being inconstant in number and thickness in different parts of the district.

The strata of the overlying Wenlock Series present all the characters of the Denbigh Grits and Flags of North Wales. Some 2,000 feet are developed in this district, the upper beds consisting of grits and flags, while the lower are mainly shales and mudstones.

The Llandovery Series, which underlies the Tarannon Series, has, at present, been recognized only in the western part of the district, namely, in the valley of the Twymyn, and its rocks are brought to the surface by an anticlinal fold. Representatives of nearly the whole of the Llandovery beds have been met with at different localities, and five distinct graptolitic zones have been recognized. The rocks, which consist almost entirely of soft shales and mudstones, are probably not more than 400 feet thick.

A comparison of the graptolitic lists shows that the Tarannon Series, as here defined, corresponds almost exactly with the Gala or Queensberry Group of the South of Scotland, includes all the palæontological zones hitherto assigned to the Tarannon, and fills up the whole period intervening between the Llandovery below and the Wenlock above. It includes the extreme beds which have been mapped as Tarannon by the Geological Survey in Wales; and in the Tarannon District, at all events, the thickness of the series is equivalent to its maximum development elsewhere.

CORRESPONDENCE.

SMALL FOSSIL SHELLS PRESERVED WITHIN THE INTERIOR OF LARGER ONES AND IN THE BODY-CHAMBER OF CEPHALOPODS.

SIR,—It is a well-known fact to all collectors of fossils and practical geologists, that in the interior or body-cavity of larger fossils very often smaller ones may be found splendidly preserved, which otherwise are not to be got at all, or only in a very poor state, being crushed or weathered or wholly destroyed. In this way, when I worked, especially on the Tertiaries, I obtained the very

finest and rarest things by taking home with me portions of broken and badly damaged specimens of larger species and examining their contents at leisure. Very often, too, I found extremely fine and interesting fossils in the interior of Mesozoic and Palæozoic shells, in the moulds or casts of the living or body-chambers of Ammonites and other Cephalopoda, whose preceding chambers sometimes had completely disappeared. Dr. Krause described a complete specimen of a crab, *Glyphæa leionoton*, found in the living chamber of an *Ammonites gigas* from our Portland Beds (*Zeitschrift Deutsch. Geol. Ges.*, xliii, p. 194, pl. x, fig. 1), and I got only last summer a very fine complete specimen of *Æger*, n.sp. (?), with the antennæ preserved, in the living chamber of a large *Stephanoceras* from our Middle Jurassic beds. I therefore cannot agree with the view expressed in the English edition of Zittel's Textbook of Palæontology (translated and edited by C. R. Eastman, p. 658), that "some of these bodies (viz., *Cardiocaris*, *Pholadocaris*, and *Spathiocaris*), which have been found in the living chamber of *Goniatites* (*G. intumescens*), have undoubtedly served as opercula or aptychi of these Cephalopods." I may add that they are not commonly found there, and if there, as usual together with specimens of *Orthoceras*, *Cardiola*, small *Goniatites*, *Entomis*, and other fossils, certainly have nothing to do with the organisation of *Goniatites intumescens*, but only happen to occur associated with it in the same rock.

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OBITUARY.

JOHN GEORGE GOODCHILD, F.G.S.

BORN MAY 26, 1844.

DIED FEBRUARY 21, 1906.

IT is with much regret we have to record the death of a valued member of the Geological Survey of Scotland, who for some years had filled the office of Curator of the Geological Survey Collections in the Royal Scottish Museum, and who died in Edinburgh on the 21st February after a lingering illness. Born near London on 26th May, 1844, he joined the Geological Survey in 1867, and for many years was engaged in mapping areas in the north of England, particularly in the neighbourhood of the Lake District. Thereafter he was removed to the Survey Office in Jermyn Street, London, and in 1887 was transferred to Scotland, where he was placed in charge of the collections obtained by the Scottish staff, and deposited in the Royal Scottish Museum, an appointment for which he was specially adapted. In recent years he had charge of the Scottish Mineral Collection in the same museum, which led him to devote a large amount of time to the special study of mineralogy. Gifted with remarkable fluency and lucidity of exposition, he became widely known as a successful lecturer on geology. During 1884, 1885, and 1886, he gave courses of lectures on physical geography, geology,